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MALACOLOGICAL NOTES

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FIRST ILLINOIS RECORD OF A JAPANESE POND SNAIL

On November 18, 1938, I found a dead, not full-grown but identifiable specimen of *Cipangopaludina malleata* Reeve, in the outer lagoon in Jackson Park, Chicago. It is entered in Field Museum Catalogue as No. 11438 and is figured here-with (fig. 7).



FIG. 7. *Cipangopaludina malleata* Reeve, from Chicago; Field Mus. No. 11438.  $\times 5/3$ .

I am indebted to Mr. E. Strandine, of Northwestern University, and to Mr. F. C. Baker, of the University of Illinois, for the statement that to their knowledge this species has never been recorded from Illinois; nor does it seem to have been found in the adjacent states. This Japanese intruder has hitherto been known only from the Pacific slope, and from some places on the Atlantic coast; records of the species in the United States will be found

in various volumes of *The Nautilus*.

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REVERSED SPECIMENS OF CAMPELOMA FROM THE CHICAGO AREA

Some information concerning reversed specimens of shells belonging to the genus *Campeloma* Rafinesque has been assembled by F. C. Baker in his *Fresh Water Mollusca of Wisconsin* (Bull. Wis. Geol. Nat. Hist. Surv., 70, 1928). Additional data recorded here refer to the species *integrum* Say and *decisum* Say.

Baker (l.c., p. 67) says with reference to *Campeloma integrum* that he found only one reversed specimen among 160 normal ones, and that none were seen as embryos. Field Museum has one reversed female

of *integrum* (No. 11506), collected on the Wooded Island in Jackson Park, Chicago, by H. W. Clark, in March, 1903, which contained 21 embryos, one of which is reversed. This seems to be the first indication that reversed specimens may transmit their anomaly to their offspring, but the one instance is, of course, inadequate for definite conclusions on this point.

Baker (l.c., p. 60) remarks that reversed specimens of *Campeloma decisum* are very rare, "but one immature shell occurring among over a hundred adult specimens and but four among 260 embryonic young." In the Field Museum collection is a reversed immature shell (No. 11479), found in the outer lagoon in Jackson Park, Chicago, by the writer, on December 6, 1938. A normal female shell (No. 11508), collected in the Kankakee River near Shelby, Lake County, Indiana, by O. P. Hay, on September 20, 1895, includes one reversed embryo among the four contained in it; and there is another reversed embryonic shell contained in a collection of normal *decisum* from the same locality (No. 5256).

#### TAXONOMY OF THE LARGER GROUPS OF ASIATIC VIVIPARIDS

In arranging the Viviparidae of Field Museum I find it necessary to revise the status of some generic and subgeneric names bestowed on Asiatic viviparid snails. The most modern synoptic view of the family, that of Thiele (Handb. syst. Weichtierk., pp. 114–116, 1929), is out of date on account of Rohrbach's anatomical investigations (Arch. Molluskenk., 69, 1937), which prove that the Asiatic viviparids (with the exception only of those from Asia Minor belonging to *Viviparus* proper) do not even group with the Viviparinae; they are closely related to the African genus *Bellamyia* and constitute with it the subfamily Bellamyinae. Rohrbach (l.c.) clearly showed that the many Asiatic species which had been attributed to true *Viviparus* present anatomical features which can only be compared to those of the African genus *Bellamyia*, but he did not discuss the question of their generic position. My work necessitated going into this question, and I arrive at the arrangement of the genera and subgenera of the Asiatic Bellamyinae shown below. It seems that two different groups of genera may be distinguished as follows:

- A. A group of thin-shelled, generally larger forms, almost destitute of shell-adornments like knots, ribs, and keels. It contains the following genera:

*Bellamyia* Jousseaume, 1886 (type, *Paludina bellamyia* Jous.), to which most of the African viviparids belong and which

is represented in Asia by species from India (*dissimilis* Muell., *bengalensis* Lam., etc.), from the Sunda Islands (e.g. *javanica* v.d. Busch), from the Philippine Islands (e.g. *angularis* Muell.), and so on.

*Lecythoconcha* Annandale, 1921 (type, *Paludina lecythis* Benson), from India.

*Idiopomus* Pilsbry, 1901 (type, *Vivipara henzadensis* Pilsbry), from Burma.

- B. A group of thick-shelled genera with generally rather convex whorls, often provided with raised ornamentations in the shape of knots, keels, and even spines.

*Mekongia* Crosse and Fischer, 1876 (type, *Paludina jullieni* Deshayes), from French Indo-China, a rather highly specialized genus which is probably derived from forms like *Cipangopaludina*.

*Eyriesia* P. Fischer, 1885 (type *Paludina eyriesi* Morelet), from Cambodia, also a highly specialized form. 1939

*Cipangopaludina* Hannibal, 1912 (type, *Paludina malleata* Reeve), from Japan, China, and the Amur province of Siberia.

*Angulyagra* Rao, 1931 [= *Dactylochlamys* Rao, 1925, not Lauterborn, 1901] (type, *Paludina oxytropis* Benson), from India, Burma, and the Philippines. *Angulyagra* proper comprises by far most of the species belonging to this genus.

**Acanthotropis**<sup>1</sup> subgen. nov. created for *Vivipara partelloi* Bartsch from Lake Lanao, Mindanao, Philippine Islands, is characterized by the possession of a distinct keel at the circumference of the two last whorls; this keel is ornamented by hollow spines curving back, like those in the African freshwater snail *Tiphobia* E. A. Smith (thiarid) or in the *Phyllo-notus* section of *Murex*.

*Heterogen* Annandale, 1921 (type, *Heterogen turris* Annandale), is known only from Lake Biwa, Japan.

*Laguncula* Benson, 1842 (type, *Laguncula pulchella* Benson), from Chusan Island, a somewhat problematic genus.

*Taia* Annandale, 1918 (type, *Vivipara naticoides* Theobald), seems to have a rather wide distribution in Asia, where it is

<sup>1</sup> ακαρυδα, spine; τροπισ, keel.

split up into the following distinguishable groups or subgenera:

*Taia* proper is confined to India and Burma.

*Temnotaia* Annandale, 1919 (type, *Taia incisa* Annandale), comes from Burma.

*Sinotaia*<sup>1</sup> subgen. nov. (type, *Paludina quadrata* Benson) seems to comprise the Chinese species hitherto attributed to *Viviparus*, which group around *quadratus* Benson and *angulatus* Benson. They are characterized by the narrow, rather thick shell with an expanded columellar thickening, mostly blackish towards its outer margin, and by the indication or strong development of keels on the upper, middle, and lower part of the whorls.

*Torotaia*<sup>2</sup> subgen. nov. (type, *Vivipara clemensi* Bartsch) comprises two Philippine species, *mainitensis* Bartsch and *clemensi* Bartsch. Its characteristics are the broad, somewhat scalarid spire, the ventricose whorls and the presence of some ribs on the whorls which may assume the strength of keels. The umbilicus is always closed and the lower margin of the aperture is protracted to some degree near the columella.

*Margarya* Nevill, 1877 (type, *Margarya melanoides* Nevill), from Yunnan.

*Rivularia* Heude, 1890 (type, *Paludina (Melantho) auriculata* Martens) from China.

#### A NEW LOCALITY FOR RHINOCORYNE PACIFICA

*Rhinocoryne pacifica*, most striking of all the living Cerithiidae, originally described by Sowerby (1833) as *Cerithium pacificum*, seems by no means abundant. E. von Martens (Biol. Centr. Amer., Mollusca, p. 574, 1900) has summed up our knowledge of this species, and apparently it has not been mentioned in the literature since. Von Martens established the subgenus *Rhinocoryne* for this species, and this is now regarded as of generic rank.

In these references it is mentioned only from the Pacific coast of both Americas from Arica (southern Peru) in the south to Punta Arenas (southwestern Costa Rica) in the north. Field Museum has a lot of 14 specimens of *Rhinocoryne pacifica* (No. 11521), from

<sup>1</sup> Sivas, China; *Taia*, generic name.

<sup>2</sup> Torus, a raised ornament; *Taia*, generic name.

Corinto, Nicaragua, about 100 miles north of the most northern locality hitherto known.

The specimens were collected by S. E. Meek, in April, 1906, partly in living state, partly inhabited by hermit crabs.

POLYPYLIS, AN APPARENTLY OVERLOOKED SUBGENUS OF SEGMENTINA

The subgeneric name *Polypylis* was proposed by Pilsbry (Proc. Acad. Nat. Sci. Phila., p. 166, 1906) for some east Asiatic species of planorbids formerly attributed to the European genus *Segmentina* Fleming and grouping around *Planorbis largillierti* Dkr. These species differ from *Segmentina* proper in the following characters, using Pilsbry's own words: "The shell is less compressed and not carinate, but glossy with deeply clasping whorls. The parietal lamina is obliquely transverse, the others transverse, basal long, a shorter one in the outer wall, and one or two in the upper margin. There are several or many barriers." True *Segmentina* on the contrary is characterized by "a very glossy, flattened shell with acutely angular periphery, simple thin lip, deeply embracing whorls, and barriers composed of three laminae (parietal, basal, and upper) transverse to the whorl, leaving a narrow, three-branched space between them."

These differences may be seen in the accompanying figures. Figure 8, *b*, shows the disposition of barriers in the European *Segmentina nitida* Mueller; figure 8, *a*, exhibits that of the Chinese *Segmentina hemisphaerula* Benson; figure 8, *b*, is copied from Rossmassler (Icon., 1, fig. 114); figure 8, *a*, is new. In both cases the last part of the last whorl has been removed in order to show clearly the set of laminae. These figures show that the east Asiatic segmentinas cannot be united to *Segmentina* proper, and that Pilsbry was right in proposing for them the new subgenus *Polypylis*.



FIG. 8. *a*, *Segmentina (Polypylis) hemisphaerula* Benson, Field Mus. No. 7388, showing disposition of inner laminae.  $\times 3$ . *b*, *Segmentina (Segmentina) nitida* Mueller, showing inner laminae (from Rossmassler).  $\times 3$ .

Though plainly described, this name escaped the attention of the recorders. Neither the *Zoological Record*, the *Nomenclator generum et subgenerum animalium*, nor Thiele, in his comprehensive *Handbuch der systematischen Weichtierkunde*, mentions it; even Mori, the most recent author on east Asiatic planorbids (Mem. Coll. Sci. Kyoto Imp. Univ., B, 14, 1938) omits it. Germain, who worked on Planorbidae in 1921-24 (Rec. Indian Mus., 21), had noticed it, but, as

he says (p. 164), he did not judge the differences emphasized by Pilsbry sufficiently important to warrant the new subgenus; he therefore groups all the east Asiatic species which may belong here with true *Segmentina*.

From Germain's list of species we can clearly see which forms have the characteristic disposition of the inner laminae, and thus belong to the subgenus *Polypylis*. These are:

*Planorbis hemisphaerula* Benson, 1842. *Planorbis largillierti* Dunker, 1867, is synonymous with this species; thus the genotype of *Polypylis*, for which Pilsbry had designated *Planorbis largillierti* Dunker, automatically becomes *Planorbis hemisphaerula* Benson.

*Planorbis calathus* Benson, 1850. Germain cites this species as *Segmentina calatha*, but the specific name ought to be *calathus*, this word being a noun meaning a basket.

*Segmentina lucida* Gould, 1859 (= *Segmentina usta* Gould, 1859).

*Planorbis swinhoei* H. Adams, 1870.

These species must now be cited as *Segmentina (Polypylis) hemisphaerula* Benson, *Segmentina (Polypylis) calathus* Benson, and *Segmentina (Polypylis) swinhoei* H. Adams. The first lives in southern China, including the Riu-kiu Islands; the second is found in British India and Ceylon, in Siam, in Java, and in the Aroe Islands, and the third in the Riu-kiu Islands and in Japan; the last is known only from the Island of Formosa and is occasionally considered a mere subspecies of *lucida* Gould.

The rest of the species included by Germain in the Asiatic *segmentinas* seem to differ from *Polypylis* in the absence of inner laminae.

#### WHAT IS LIMNAEUS SORDIDUS KUESTER, 1862?

Kuester described a *Limnaeus sordidus* supposedly from Central America in his monograph of the genus *Limnaea* (in Martini-Chemnitz, *Illustr. Conch. Cab.*, (2), 1, Abt. 17b, p. 58, figs. 15-16, pl. 12, 1862). This species was not reported from Central America by later collectors, and came to be considered a spurious one, except by von Martens. Von Martens believed that it might be an American species after all (*Biol. Centr. Amer.*, Mollusca, p. 379, 1899), as it very much resembled some of Haldeman's *Limnaea palustris* in shape and in its latticed sculpture; he furthermore noticed in the Dunker collection, now in the Berlin museum, a shell supposedly originating in Central America, which resembled *sordidus* in every respect. On the other hand, he had never seen a *palustris* form from Central America, and

hence decided that Kuester's *sordidus* might be a North American shell comparable to *L. elodes* Say. F. C. Baker, in his monograph of the American limnaeids (Spec. Publ. Chicago Acad. Sci., No. 3, p. 313, 1911), went so far as to combine *sordidus* and *palustris*, mistrusting the locality "Central America," on the ground that the *palustris* group had never been found south of the Rio Grande.

In the collections in Field Museum I find four specimens of a limnaeid (No. 11466) from Lake Chalco, central Mexico, collected by S. E. Meek, in April, 1901, which, though in a poor state of preservation, undoubtedly belong to the *palustris* group.



FIG. 9. *Stagnicola (Stagnicola) palustris sordida* Kuester (from Kuester's original pictures of *Limnaeus sordidus* Kuester).  $\times 1$ .

They combine the *palustris* shape of the shell with the sculpture of vertical and horizontal ridges, forming the fenestration described by Kuester as characteristic of *Limnaeus sordidus*, and visible in our copy of Kuester's original figure (fig. 9). The specimens in Field Museum differ from those figured by Kuester in being some-

what more slender, but not so much so as to prevent their identification with *sordidus*.

As there is no further doubt that a form of *palustris*, apparently distinguishable from the typical one and from the North American subspecies of *palustris*, exists in Mexico, and as Kuester's *sordidus* is based on a fenestrated Mexican form of *palustris*, I do not hesitate to name the Chalco specimens *Stagnicola (Stagnicola) palustris sordida* Kstr.

#### THE SOUTH AMERICAN SPECIES OF PLANORBULA

Apparently no author has hitherto assigned any South American planorbid to *Planorbula*, though earlier workers did know that some species in question are provided with internal shell septa; these include Clessin (Martini-Chemnitz, *Illustr. Conch. Cab.*, (2), 1, Abt. 17, *Planorbis*), when describing his *Planorbis janeirensis* (l.c., p. 122, fig. 3, pl. 18, 1885), and Fred Baker, when publishing his *Segmentina paparyensis* (*Proc. Acad. Nat. Sci. Phila.*, 1913, p. 662, figs. 9-11, pl. 26, 1914). Lutz, the last reviser of the Brazilian planorbids (*Mem. Inst. Oswaldo Cruz*, 10, pp. 45-61, pls. 15-18, 1918) dealt only with their specific discrimination and did not touch the problem of their generic position; he, therefore, left *paparyensis* with *Segmentina*.

When I found some specimens of "*Segmentina*" *paparyensis* F. Baker in a lot of shells from northeastern Brazil, which had been entrusted to me for classification by Dr. O. Schubart, then in Recife, and on which I shall report elsewhere, I was immediately struck by the idea that this species, together with *Planorbis janeirensis* Clessin, of which it is only a local subspecies, belongs to *Planorbula*. It is obvious also that they differ so much from this genus that they have to be placed in a distinct new subgenus, for which I propose the name **Obstructio** (for reasons which will be obvious), designating *Planorbis janeirensis* Clessin as the type. The characteristic features of this new subgenus, in comparison with true *Planorbula*, are as follows:

Thickening of the lip constantly wanting; disposition of the six internal septa as follows: two parietal septa subequal, at least never so different in size as in true *Planorbula*; four palatal septa, the two upper nearly horizontal.

There is in Africa a planorbid group of snails which, from the anatomical data available (Connolly, Trans. Roy. Soc. S. Afr., **12**, pp. 196-199, fig. 25, 1925), and from conchological characters, must belong to *Planorbula*. This group is represented by *Planorbula pfeifferi* Krauss and its allies. Jickeli established the subgenus *Planorbulina* for it (Nova Acta Acad. Leop. Carol., **37**, p. 221, 1874).

#### NOTES ON VALVATIDS WITH A DESCRIPTION OF A NEW SUBGENUS

In a recent paper (Über potentielle Skulpturbildung bei *Valvata* (*Cincinna*) *piscinalis antiqua* Sow., Arch. Moll. Kde., **70**, pp. 41-45, 1938) I have described what I called a "potential shell-sculpture" in the European *Valvata* (*Cincinna*) *piscinalis antiqua* Sow. The specimens considered were collected in Lake Lucerne, Switzerland, and are distinguished from ordinary ones from other localities by a faint but unmistakable sculpture of radial rib-like striae and of spirally revolving lines. The fact that only valvatas from lacustrine habitats show such a shell-sculpture leads me to the conclusion that the lacustrine environment is in some way correlated with sculpturing in fresh-water mollusk shells.

In the paper mentioned above I gave a list of what is known about palaeartic sculptured *Valvata*, both recent and fossil. Heavily sculptured forms are always restricted to some lacustrine basin, and smooth, unsculptured valvatas of Europe and Asia, inhabiting various fresh-water habitats, develop traces of sculpture only when they occasionally live in a lake; they thus prove that the formation of shell-sculpture is an inborn characteristic of valvatids, which remains



inactive in the non-lacustrine environment, but becomes potential when the habitat, for reasons still unknown, but certainly in some relation to lacustrine life, encourages its development. Such development is only phaenotypic.

Many species of valvatids restricted to lacustrine basins have acquired rather conspicuously developed shell-sculpture: the subgenus *Megalovalvata* Lindholm from Lake Baikal; *Costovalvata* Polinski, from Lake Ochrida in Albania; and the uncoiled tubiform fossil valvatid genus *Orygoceras* Brusina in the southeastern European Pliocene—the so-called “Neogene Lake.” In all these cases the presence of sculpture has surely become a genotypic, inheritable feature. The presence of a keeled sculpture in the North-American subgenus *Tropidina* H. and A. Adams, is probably due to such a genotypic feature acquired during prolonged lacustrine life and become invariable, so that even after the species thus adorned emigrated from their original habitat to enter other fresh-water habitats, the sculpture remained fixed.

All the palearctic lacustrine and sculptured valvatids have received subgeneric names in correspondence with the type of their sculpture and their geographic isolation. Spiral sculpture seems to be more frequent than radial, only one subgenus being hitherto known which exhibits the latter type, *Costovalvata* from Lake Ochrida; but in this subgenus the radial sculpture is not clearly shown, as it is crossed by the traces of a spiral sculpture around the circumference of the whorls. There are a few valvatids, however, which present definitely radial sculpture, which may be restricted to the apical whorls or which may extend over the whole shell, but which can always be discerned. These features distinguish the species in question from all other living or extinct valvatas, and I therefore feel justified in uniting them into a new subgenus which also has some characteristic and differentiating anatomical characters and which also apparently differs from the rest by some ecological habits. I call this new group:

**Pleurovalvata**<sup>1</sup> subgen. nov.

Type, *Valvata sincera* Say.

*Shell*.—Trochiform, globose or depressed, exhibiting always on the apical whorls and usually on the whole shell surface a regular, radial striation which is often raised into thin, elevated, rib-like lamellae.

<sup>1</sup> πλευρον, rib; *Valvata*, generic name.

*Jaw*.—Serrations on the lower margins of plates much finer and more numerous than in other subgenera.

*Radula*.—Central tooth either higher or larger than in other valvatas.

*Remarks*.—*Valvata lewisi* Currier also belongs in this subgenus. The fossil Californian *Valvata densestriata* Pilsbry may be found to belong here likewise.

Judging from F. C. Baker's notes (The Fresh Water Mollusca of Wisconsin, Pt. I, Gastropoda, Bull. Wis. Geol. Nat. Hist. Survey, 70, 1928), from which I also have derived the data referring to jaw and radula, all the species and their varieties which are regarded above as certainly belonging to *Pleurovalvata*, are found in lakes. Only the var. *helicoidea* Dall of *lewisi* is reported from a slough, and it is worth mentioning that in this non-lacustrine form the sculpture is often obsolete. Thus the ecological distribution of the members of this new subgenus *Pleurovalvata* helps to support my theory that lacustrine environmental conditions are in some way connected with the development of shell-sculpture.

#### AFFINITY OF PAPUINA GLOBULA

*Papuina globula* I. Rensch, Zool. Anz., 92, p. 226, fig. 1, 1930; von Benthem-Jutting, Nova Guinea, 17, Zool., p. 43, 1933.

The original locality for this species is given as "Pulie-Fluss, Kap Merkus, Neu-Pommern." Field Museum has a series of 11 specimens (Cat. No. 11707) from Pelilo Island, near Cape Merkus, southwestern New Britain (= Neu Pommern) collected by A. B. Lewis during the Joseph N. Field Anthropological Expedition, 1909-13. These specimens leave no doubt that *globula* is very closely allied to *Papuina fringilla* Pfr. from New Georgia, Solomon Islands, and from the Admiralty Islands, and that it is probably only an albino geographical race of it. I. Rensch (l.c.) suggests that *Crystallus fctilia* Clapp (Bull. Mus. Comp. Zool., 65, p. 397, pl. 4, figs. 1-3, 1923) from Anki, Malaita Island, Solomon Islands, may be identical with *P. globula*, but this view cannot be supported, Clapp's species apparently being a member of the subgenus *Crystallopsis*, whereas *globula* proves to be a true *Papuina*. It is listed in Field Museum's collection as *Papuina fringilla globula* I. Rensch.

#### IDENTITY OF PLACOSTYLUS (LEUCOCHARIS) DORSEYI

The species mentioned was described in 1910 (Field Mus., Zool. Ser., 7, p. 219, pl. 4, fig. 1). Dall had only one specimen before him, the type (Field Mus. No. 11254), which came from Anair Island,

near New Ireland, Solomon Islands; the author considered his new species to be "by far the smallest and most delicate species of *Placostylus*."

When reviewing Field Museum's collection of Melanesian land shells, I was surprised to find that Dall had attributed the small, delicate species he had described, to *Placostylus*, for it obviously is a *Partula* and, furthermore, a form closely related to *P. flexuosa* Hartman. I do not hesitate, therefore, to remove it from *Placostylus* and to write it *Partula (Melanesica) flexuosa dorseyi* Dall, since it may be subspecifically different from typical *flexuosa*, coming from another island.